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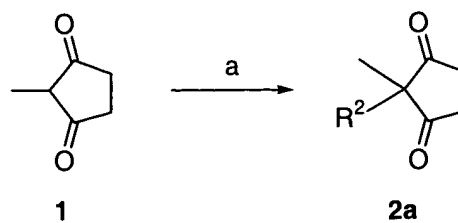
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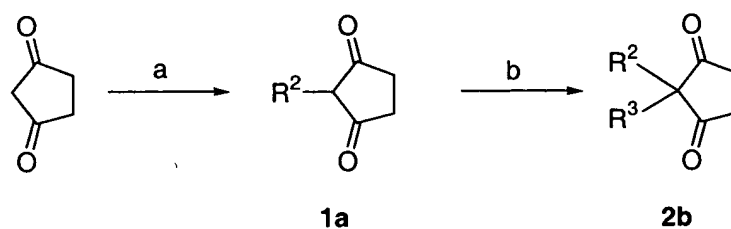
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**Scheme 1**

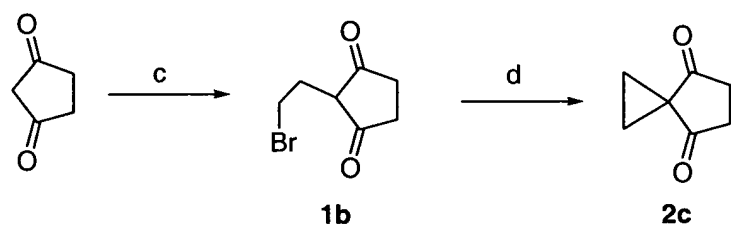
Equation 1



Equation 2

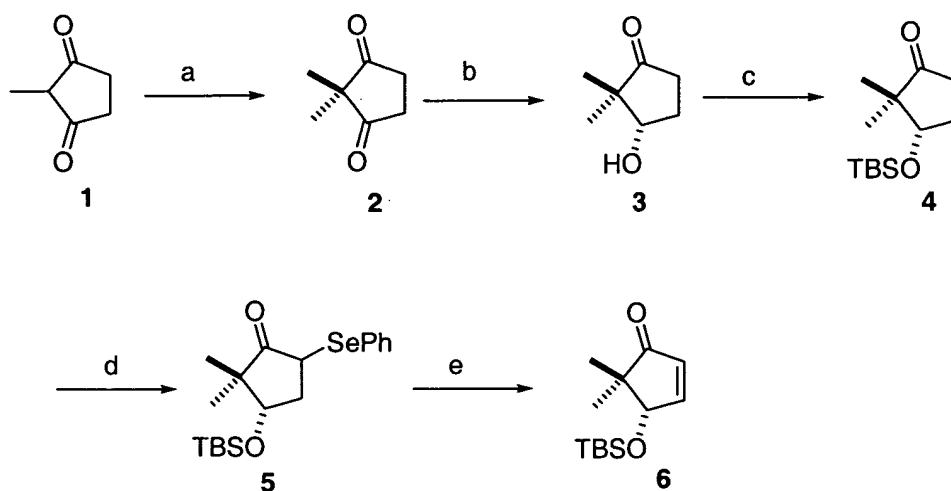


Equation 3



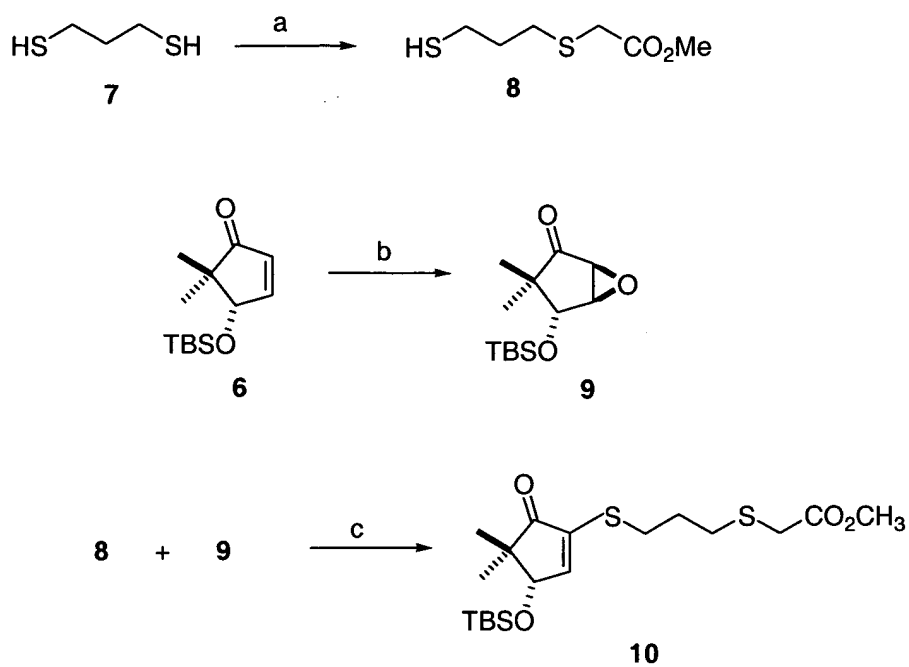
(a) KOH, I-R<sup>2</sup>, dioxane/H<sub>2</sub>O; (b) KOH, I-R<sup>3</sup>, dioxane/H<sub>2</sub>O; (c) KOH, 1,2-dibromoethane, dioxane/H<sub>2</sub>O; (d) KOH, dioxane/H<sub>2</sub>O.

**Scheme 2**



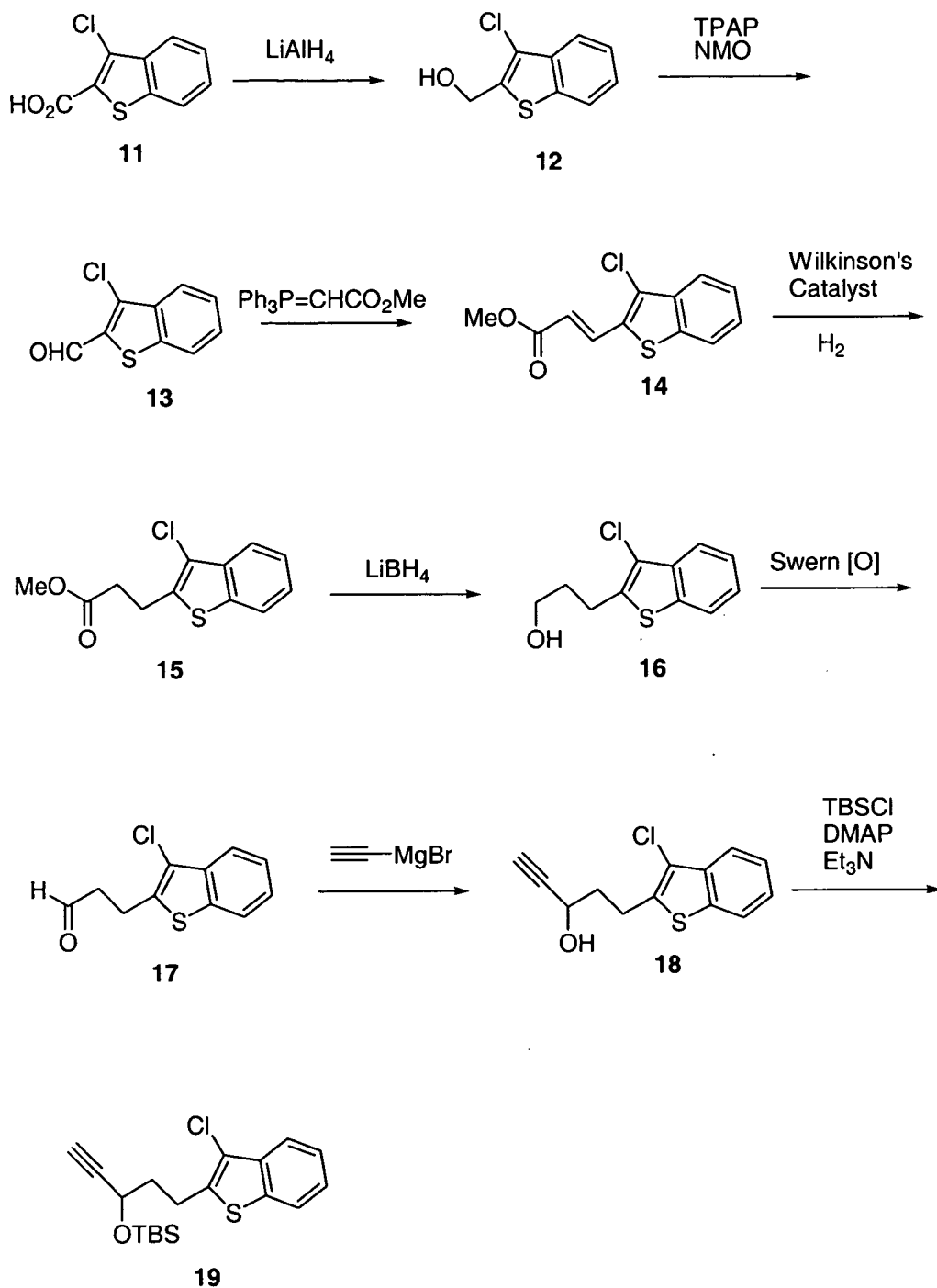
(a) KOH, MeI, dioxane/H<sub>2</sub>O; (b) Baker's Yeast, D-glucose, H<sub>2</sub>O; (c) TBSOTf, 2,6-lutidine, CH<sub>2</sub>Cl<sub>2</sub>; (d) LDA, THF; PhSeCl; (e) 30% H<sub>2</sub>O<sub>2</sub>, CH<sub>2</sub>Cl<sub>2</sub>.

**Scheme 3**

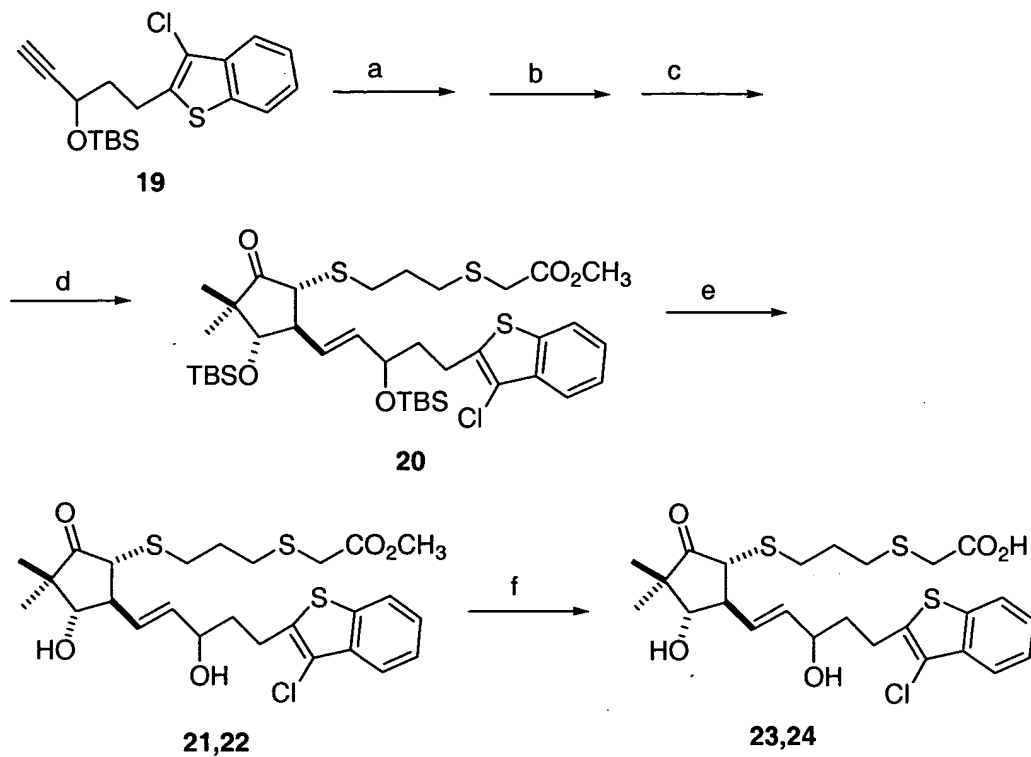


(a) NaH, BrCH<sub>2</sub>CO<sub>2</sub>CH<sub>3</sub>; (b) H<sub>2</sub>O<sub>2</sub>, NaOH, MeOH; (c) basic Alumina, CH<sub>2</sub>Cl<sub>2</sub>.

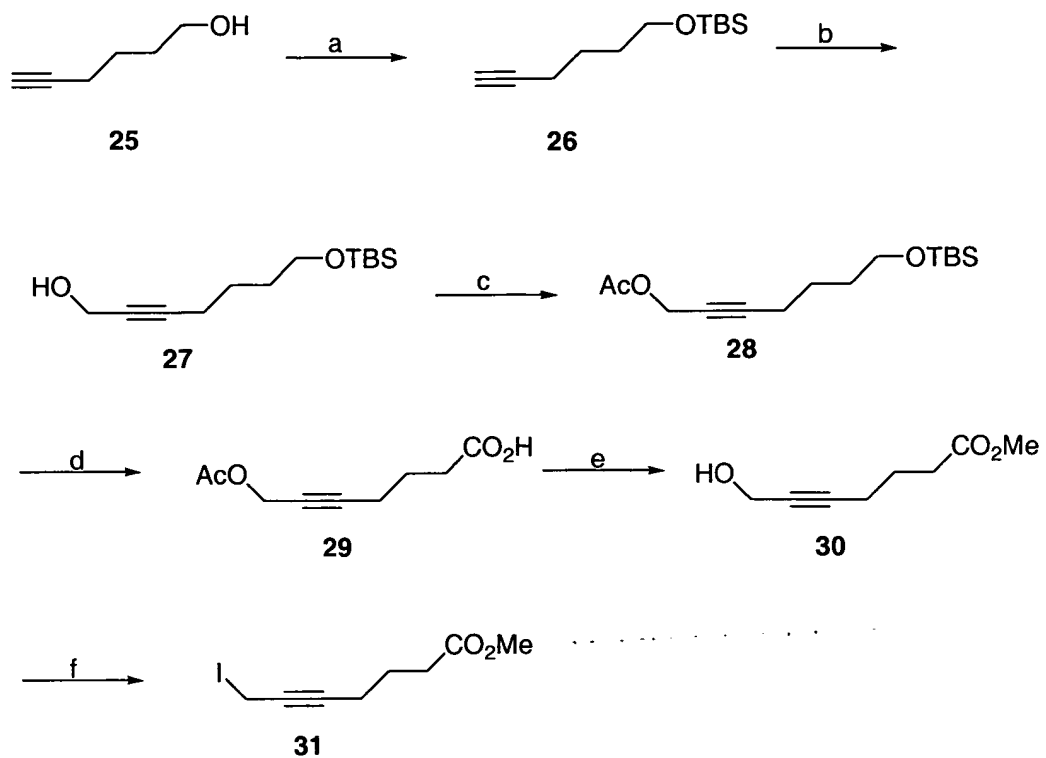
**Scheme 4**



**Scheme 5**

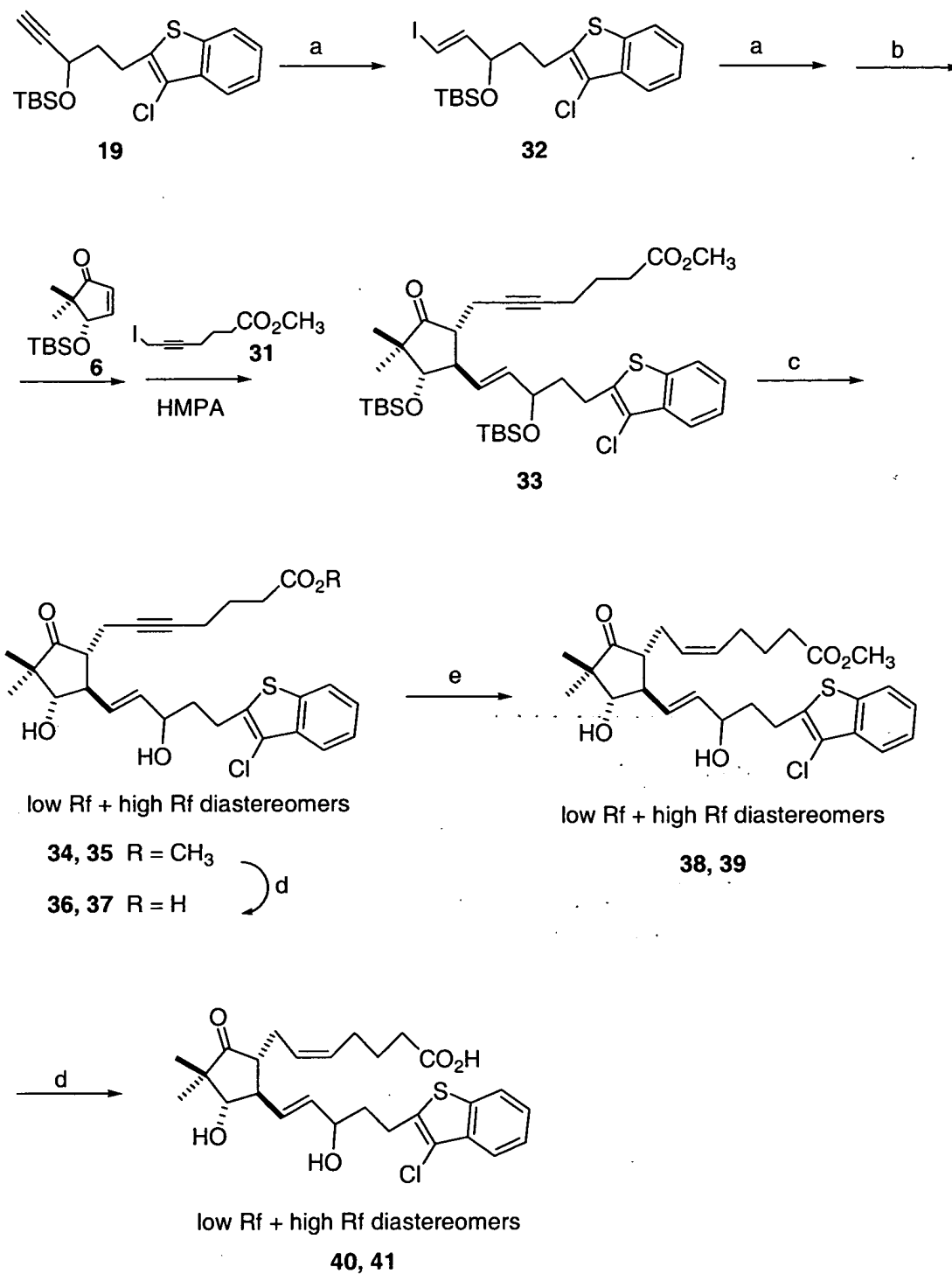


**Scheme 6**



(a) TBSCl, etc.; (b) *n*-BuLi; DMF; (c) Ac<sub>2</sub>O, pyridine; (d) Jones oxidation; (e) MeOH, AcCl; (f) PPh<sub>3</sub>, I<sub>2</sub>, imidazole, CH<sub>2</sub>Cl<sub>2</sub>.

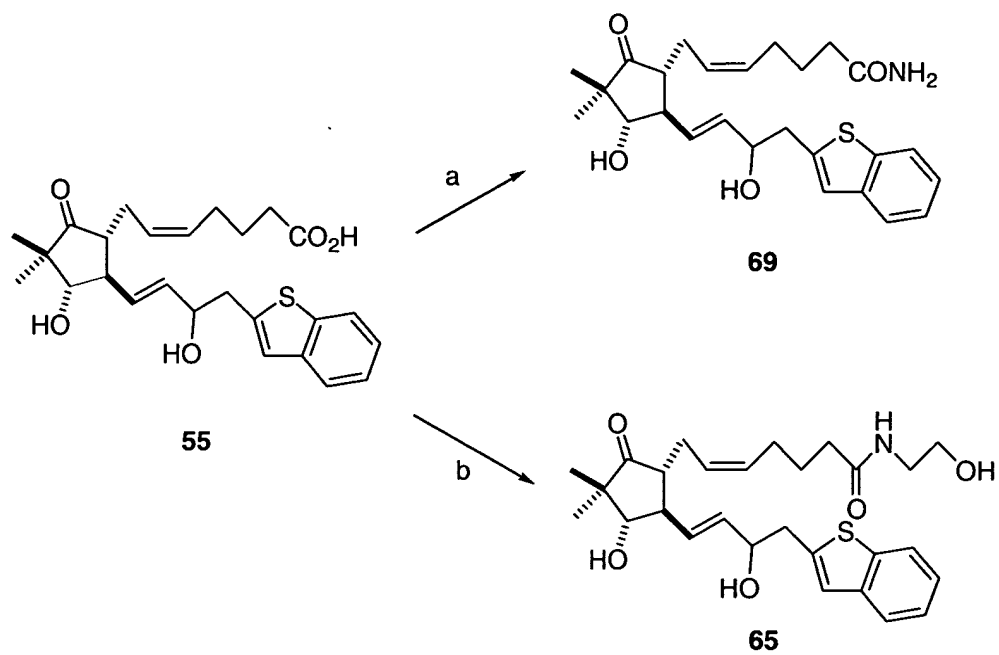
**Scheme 7**



(a) *t*-BuLi, THF -78 °C; (b) Me<sub>2</sub>Zn; (c) HF-pyridine, CH<sub>3</sub>CN; separate diastereomers; (d) rabbit liver esterase, pH 7.2 phosphate buffer, CH<sub>3</sub>CN; (e) NiCl<sub>2</sub>, NaBH<sub>4</sub>, ethylenediamine, H<sub>2</sub>, THF;



**Scheme 8**



(a)  $\text{ClCO}_2\text{CH}_2\text{CH}_3$ ,  $\text{Et}_3\text{N}$ ,  $\text{CH}_2\text{Cl}_2$ ;  $\text{NH}_4\text{OH}$  (aq);

(b) EDCI, N-hydroxysuccinimide,  $\text{H}_2\text{NCH}_2\text{CH}_2\text{OH}$ , DMF.